

1 **WHAT IS CLAIMED IS:**

2 1. A parking guidance system installable on large vehicles with a driver
3 compartment, a bumper, the parking guidance system comprising
4 a horizontal bar (11) being hollow, mounted on the bumper and having
5 a front;
6 at least one segment; and at least one view port on the front surface;
7 a data collection assembly (10) being installed in the horizontal bar (11) and
8 comprising:
9 an assembly controller (20) having multiple inputs and multiple
10 outputs and processing distance and video data for transmission;
11 a memory device (21) connected to the assembly controller (20) and
12 storing combination ultrasonic transmitter and detector module identification
13 codes and parametric data;
14 multiple combination ultrasonic transmitter and detector modules (30)
15 to sense objects through the view port that the vehicle is approaching, connected
16 respectively to inputs of the assembly controller (20) and having
17 an ultrasonic transmitter and receiver unit (32);
18 a signal processing circuit consisting of
19 a microprocessor (31) connected to the ultrasonic
20 transmitter and receiver unit (32) to control the reception of echoed signals
21 and to the assembly controller (20) to pass digital signals to the assembly
22 controller (20);
23 a signal amplifier (33); and
24 an A/D signal converter (34); and

1 unique identification codes;

2 a signal transmitter (50) being an RF signal transmission module,

3 connected to the output of the assembly controller (20) and transmits RF signals;

4 and

5 a console unit (60) comprising

6 a unit controller (61) having multiple inputs, multiple outputs and

7 multiple internal preset thresholds and analyzing distance data received from the

8 data collection unit (10) to determine whether an object the vehicle is

9 approaching is within a threshold range and whether to initiate a warning to the

10 driver;

11 a memory device (62) connected to the unit controller (61) and storing

12 all combination ultrasonic transmitter and detector module identification codes

13 and parametric data;

14 a signal receiver (65) being an RF signal receiver module, connected

15 to an input of the unit controller (61), receiving RF signals from the signal

16 transmitter (50) in the data collection assembly (10) and sending the RF signals

17 received to the unit controller (61);

18 an alarm (63) connected to an output of the unit controller (61) and

19 being activated by the unit controller (61) to warn the driver when an internal

20 preset threshold is exceeded;

21 a monitor (64) connected to an output of the unit controller (61) and

22 displaying images, distance data and messages; and

23 a power supply (66) providing an operating voltage to all system

24 components and being hardwired to the data collection assembly (10).

1 2. The parking guidance system according to claim 1, wherein the
2 horizontal bar (11) is hollow rectangular parallelepiped tubing and has three
3 sections, a front and multiple view ports.

4 3. The parking guidance system according to claim 2, wherein the three
5 sections of the horizontal bar (11) consist of a middle section and two end
6 sections and have connectors to easily connect the end sections to the middle
7 section and components of the data collection assembly (10) mounted in the
8 sections are interconnected with wire connectors (13).

9 4. The parking guidance system according to claim 2, wherein the view
10 ports are implemented with through holes (12) formed in the front of the
11 sections.

12 5. The parking guidance system according to claim 2, wherein the view
13 ports are implemented as a longitudinal slot (111) in the front of the sections.

14 6. The parking guidance system according to claim 1, wherein the
15 horizontal bar (11b) is cylindrical and has the view port implemented as a
16 longitudinal slot (111) on the front.

17 7. The parking guidance system according to claim 1, wherein the data
18 collection assembly (10) further includes a video camera module (40) mounted
19 in the horizontal bar (11) through a corresponding view port.

20 8. The parking guidance system according to claim 7, wherein the video
21 camera module (40) is connected to the assembly controller (20).

22 9. The parking guidance system according to claim 7, wherein the video
23 camera module (40) is connected to the monitor (64) in the console unit (60).

24 10. The parking guidance system according to claim 1, wherein the console

1 unit (60) further includes a video camera module (40) mounted in the horizontal
2 bar (11) through a corresponding view port.

3 11. The parking guidance system according to claim 10, wherein the video
4 camera module (40) is connected to the unit controller (61).

5 12. The parking guidance system according to claim 10, wherein the video
6 camera module (40) is connected to the monitor (64). 13. The parking guidance
7 system according to claim 1, wherein the horizontal bar (11) is attached directly
8 to the vehicle bumper with bolts.

9 14. The parking guidance system according to claim 1, wherein the
10 horizontal bar (11) has mounting brackets (14) being L-shaped and respectively
11 having vertical legs, horizontal legs, proximal ends attached to the bumper with
12 bolts and distal ends attached to the horizontal bar (11).

13 15. The parking guidance system according to claim 14, wherein the distal
14 and proximal ends of each mounting bracket (14) has multiple holes to micro-
15 adjust the horizontal bar (11) and the mounting brackets (14) on the vehicle.

16 16. A parking guidance device installable on large vehicles with a driver
17 compartment, a bumper, the parking guidance system comprising

18 a horizontal bar (11) being hollow, mounted on the bumper and having
19 a front;

20 at least one segment; and at least one view port on the front surface;

21 a data collection assembly (10) being installed in the horizontal bar (11) and
22 comprising:

23 an assembly controller (20) having multiple inputs and multiple
24 outputs and processing distance and video data for transmission;

1 a memory device (21) connected to the assembly controller (20) and
2 storing combination ultrasonic transmitter and detector module identification
3 codes and parametric data;
4 multiple combination ultrasonic transmitter and detector modules (30)
5 to sense objects through the view port that the vehicle is approaching, connected
6 respectively to inputs of the assembly controller (20); and
7 a signal transmitter (50) being an RF signal transmission module,
8 connected to the output of the assembly controller (20) and transmits RF signals.

9 17. The parking guidance device as claimed in claim 17, wherein each
10 combination ultrasonic transmitter and detector module comprises:

11 an ultrasonic transmitter and receiver unit (32);
12 a signal processing circuit consisting of
13 a microprocessor (31) connected to the ultrasonic
14 transmitter and receiver unit (32) to control the reception of echoed signals
15 and to the assembly controller (20) to pass digital signals to the assembly
16 controller (20);
17 a signal amplifier (33); and
18 an A/D signal converter (34); and
19 unique identification codes.